

Opinion

The Partisan Brain: An Identity-Based Model of Political Belief

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Democracies assume accurate knowledge by the populace, but the human attraction to fake and untrustworthy news poses a serious problem for healthy democratic functioning. We articulate why and how identification with political parties – known as partisanship – can bias information processing in the human brain. There is extensive evidence that people engage in motivated political reasoning, but recent research suggests that partisanship can alter memory, implicit evaluation, and even perceptual judgments. We propose an identity-based model of belief for understanding the influence of partisanship on these cognitive processes. This framework helps to explain why people place party loyalty over policy, and even over truth. Finally, we discuss strategies for debiasing information processing to help to create a shared reality across partisan divides.

The Role of Identity in Political Belief

The Party told you to reject the evidence of your eyes and ears. It was their final, most essential command. (George Orwell, 1984)

In Orwell's famous novel, 1984, he described how a totalitarian government could manipulate the minds of its citizens through a state of perpetual war, government surveillance, propaganda, and aggressive police. The main protagonist in the book was responsible for constantly revising the historical record (i.e., actively creating falsehoods) to ensure that it was always consistent with the current party line. The party ultimately demanded that citizens abandon their own perceptions, memories, and beliefs in favor of party propaganda.

There is extensive evidence that political affiliations influence attitudes, judgments, and behaviors. While it is widely accepted that identification with a political party – known as **partisanship** (see [Glossary](#)) – shapes political judgments such as voting preferences or support for specific politics, it is less obvious why political affiliations might shape perceptions of facts. For example, US Democrats and Republicans strongly disagree on scientific findings, such as climate changeⁱ [1] or economic issues (such that Republicans show much more optimistic economic expectations than do Democrats after the election of Donald Trump in 2016ⁱⁱ [2]), and even on facts that have little to do with political policy, such as crowd sizes. For instance, supporters of Donald Trump were more likely than supporters of his political opponent (Hillary Clinton) or non-voters to mistakenly identify a photo of the inauguration of President Barack Obama in 2009 as being that of the Donald Trump inauguration in 2017ⁱⁱⁱ. These examples make it clear that people do not require an authoritarian state to ignore their own eyes and ears: partisan identities bias a broad range of judgments, even when presented with facts that contradict them.

Highlights

Over 2 billion people use social media every day, and many use it to read and discuss politics. Social media also facilitate the spread of fake news and hyper-partisan content.

Online discussions of politicized topics, including political events and issues (e.g., same-sex marriage, climate change, gun control), resemble an echo chamber. That is, posts on these topics are shared primarily by people with similar ideological preferences.

Political polarization is most likely when users employ moral/emotional language. This may reflect ideological differences between people on the left versus right or partisanship.

Online partisan criticism that derogates political opponents increases political polarization.

Liberals are somewhat more likely to share cross-ideological content on social media (i.e., information posted by people with different ideological beliefs).

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The influence of partisan identities threatens the democratic process – which requires and assumes that citizens have access to reliable knowledge that allows them to participate in the public debate and make informed choices [3,4]. In the current paper we describe how the tribal nature of the human mind leads people to value party dogma over truth. Specifically, we introduce an identity-based model of belief that explains (i) why people willingly align their beliefs with political parties, and (ii) how partisan identities alter information processing linked to reasoning, memory, **implicit evaluation**, and even perception. This model describes why party affiliation exerts such a strong impact on people's judgments that they often abandon their cherished values and beliefs in favor of party loyalty [5]. Although our tribal motives and cognitive structures have existed for millennia, increases in partisanship, the behavior of political elites, and the rise in social media help to explain the recent surge of fake news. In the final section we discuss (iii) strategies for de-biasing information processing to help to create a shared reality across partisan divides. In addition to changing the goal – to value accurate information – we introduce the idea of a process-based intervention, targeted at the stage in information processing at which bias is entering.

Why Political Identities Shape Belief

Political parties tend to reflect people's **ideologies**, namely a system of beliefs and values that represents one's worldview. Ideologies stem from a combination of cultural influences and affinities, and are reflected in biological predispositions and personality characteristics [6,7]. These ideological orientations have a strong genetic basis [8], emerge early in life [9,10], and manifest in brain structure [11,12]. Because identification with a political party is a voluntary and self-selected process, people are attracted to political parties that align with their personal ideology. Indeed, the correlation between political ideology and party identification is very high, and has grown strong in recent years (e.g., identification with the Republican party is very highly correlated with conservative ideology in the USA¹⁴). This relationship varies across time and place, but there is reason to believe that political systems dominated by two competing groups may heighten partisan motives because they are particularly effective in creating a sense of 'us' versus 'them' [13].

Although ideology and identity are often closely aligned, this is not always the case. Attitudes towards specific policies often depend on one's political party affiliation, rather than on the actual alignment of the policy with one's ideological beliefs [5]. For example, in a series of studies, the attitude of participants towards a welfare policy relied on the alignment of the policy with their personal ideology (generous for liberal participants, and more stringent for conservative participants) only when no information about party endorsement was provided. When such information was provided, participants strongly relied on it and preferred the policy that aligned with their party rather than with their ideology [5]. Indeed, partisanship is one of the strongest predictors of voting behavior, regardless of policy platform [14,15].

Social identity theory [16] can help to account for this phenomenon. According to the theory, people can define themselves according to who they are as individuals as well as their membership in various social groups (defining themselves as a woman, parent, professor, Democrat, or American). Likewise, evolutionary theory has argued that the brain evolved to detect coalitional alliances [17], and neuroimaging research has found that the human brain represents political affiliations, such as Republican or Democrat, similarly to other forms of social identity [18,19]. However, the relevance of any given social identity varies with social context. When a particular membership is made salient (e.g., at a political rally or election), people are more likely to behave and experience emotions in ways that are congruent with the activated social identity [20–22]. From this perspective, 'reality is always interpreted from the

Glossary

Attention: a state of focused awareness on a subset of the available perceptual information.

Belonging goals: the pervasive drive to form and maintain lasting, positive interactions with other people.

Cognitive dissonance: the psychologically uncomfortable state induced by the co-presence of inconsistent attitudes, beliefs, or behaviors.

Distinctiveness goals: the need for uniqueness and individuation.

Epistemic closure: the desire for predictability, decisiveness, preference for order and structure, and discomfort with ambiguity.

Executive functions: a collection of brain processes responsible for planning, cognitive flexibility, abstract thinking, rule acquisition, initiating appropriate actions and inhibiting inappropriate actions, and selecting relevant sensory information.

Ideology: a system of beliefs and values that represent one's worldview.

Implicit evaluation: evaluative information that is activated automatically, sometimes without intention or awareness.

Partisanship: identification with a political party.

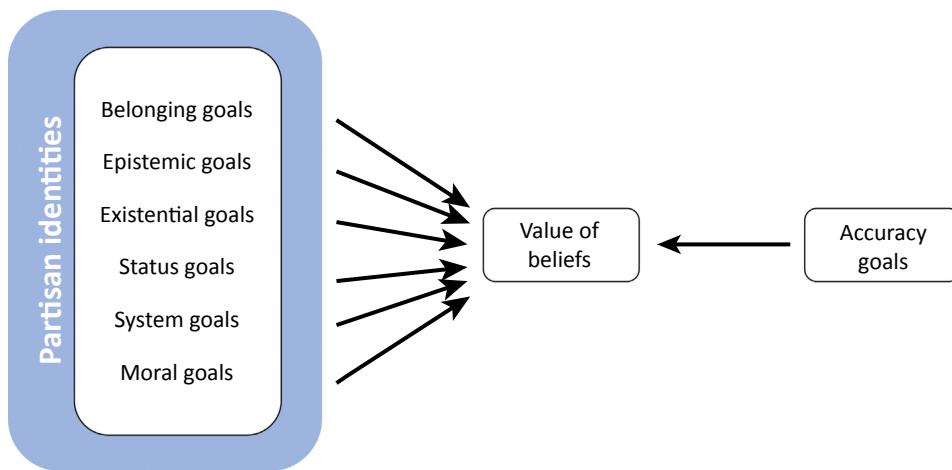
Social identity theory: an influential theory claiming that a person's sense of self is based largely on their group membership(s).

System justification: the tendency of people to tolerate, legitimize, and perpetuate the system they live in, including unfair and unequal ones, by endorsing the status quo and opposing attempts to change.

perspective of a socially defined perceiver' [23]. Indeed, social identities have been shown to shape the way people interpret information [23,24]. In turn, interpretations of the world shape political attitudes, judgments, and behaviors. Because people believe that they see the world around them objectively, members of other parties who disagree with them are seen as uninformed, irrational, or biased [25]. This phenomenon, known as naïve realism, can exacerbate intergroup conflict, and make it ever more difficult to resolve disputes between political groups [26,27].

Our ancient capacity for tribalism exerts a profound influence on contemporary politics: modern partisan identities (also known as politicized identities [28]) motivate a wide range of cognitive processes, from reasoning to perception. This is especially likely when political parties are tightly woven with political ideology and fulfill important social goals – which is common in political contexts. Social groups fulfill numerous basic social needs such as **belonging** [29], **distinctiveness** [30], **epistemic closure** [31], and access to power and resources [32], as well as provide a framework for the endorsement of (moral) values [33,34]. Political parties fulfill these needs through different means. For example, political rallies and events can satisfy belonging needs; party elites, partisan media, and think tanks provide policy information; in-group members model norms for action; electoral success confers status and power; and party policy provides guidance on the appropriateness of values [35]. To the extent that partisan identities fulfill these goals (cf [36]), they can generate a powerful incentive to distort beliefs in a manner that defies truth – especially when the net value of these goals outweighs accuracy goals (Figure 1). This is likely exacerbated when competing political parties threaten moral values and access to resources – two factors that are known to increase group conflict [32].

When different beliefs are in conflict with one another, people experience an uncomfortable cognitive state – known as **cognitive dissonance** [37]. Because cognitive dissonance is aversive, people are motivated to reduce that experience. In a famous case study, members of a doomsday cult were placed in a high state of dissonance when their prophecy that the world was about to end failed to come true. Instead of abandoning their belief in the cult, they actually



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Figure 1. Accuracy Goals Compete with Identity Goals To Determine the Value of Beliefs. Accuracy goals can promote accurate beliefs about the social and physical world unless the net value of alternative goals outweighs the value of the accuracy goal. Partisan identities can subserve numerous goals (including, belonging, epistemic, existential, status, **system justification**, and moral goals) which can distort belief when their net value outweighs accuracy goals.

increased their commitment to the belief system by rationalizing the failure of the prophecy and proselytizing others [38]. We suspect that political beliefs often operate similarly – when strongly identified members of a political party are confronted with the failure of their party or leader, many of them will be motivated to double down on their support and may even try to recruit others to join their political party.

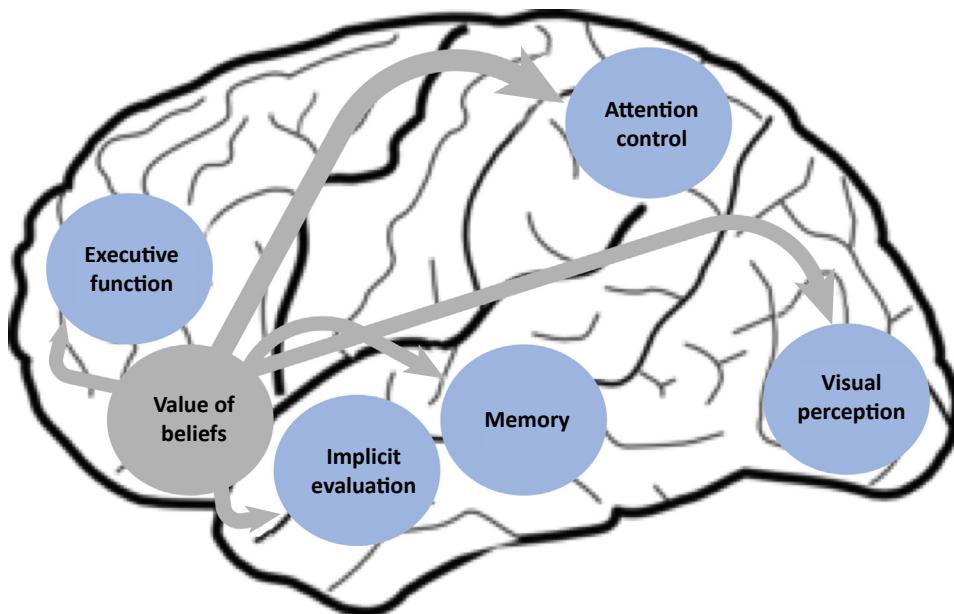
Similarly to beliefs, people often experience dissonance when their goals are in conflict, and they can reduce this feeling by changing their goals. Although people often possess accuracy goals, in some situations other goals might take precedence. For instance, a highly identified Republican observing pictures of Presidential inauguration crowds is likely to be motivated to find evidence that their party leader is more popular than the previous Democratic president. Reducing the importance of being accurate, or shifting one's assessment of what constitutes accurate information, diminishes cognitive dissonance and therefore reconciles the person with their identity goals. The goal to reduce cognitive dissonance is likely to be higher among people who have high need for closure [39], which is modestly correlated with conservatism [7]. Conservatives also value group loyalty and deference to authority more than liberals [40], factors that may exacerbate group cohesion [41]. Furthermore, some work has found political differences in credulity, such that neoliberals may be more susceptible to bullshit [42].

How Political Identities Shape the Components of Cognition

Over the past century political psychologists have provided extensive evidence that partisan identities alter political judgment and behavior [14, 15, 43, 44]. For instance, partisan identities influence reasoning on political cognition [45], including beliefs about political figures [46], political facts [47], support for policies [5], scientific issues [48], social issues [49], and beliefs in the expertise of scientists [50]. Building on neuroeconomic models of decision-making [51] and self-regulation [52], we propose an identity-based model of belief. We suggest that different beliefs under consideration are assigned a value based on the benefits that are likely to result from each belief. Then, the values are compared in order to choose a belief. Finally, after incorporating the belief (and possibly expressing it publicly or acting upon it), the brain measures the desirability of the outcomes and updates the other processes to improve future cognition.

According to our model, the orbitofrontal cortex (OFC) may be responsible for computing the value of competing goals (e.g., identity goals vs accuracy goals) [51]. This region allows highly identified individuals to value the outcomes of in-group members and engage in cognition and action consistent with their identity goals [52]. The OFC has rich functional connections with brain systems involved in reasoning (dorsolateral prefrontal cortex [53]), memory (hippocampus [54]), implicit evaluation (amygdala [55]), and even perception (visual cortex [56]) (Figure 2). Evidence from cognitive and social neuroscience suggests that these component processes are functionally dissociable in the human brain and engage in distinct computations while generating evaluations [55]. As such, understanding and decomposing these processes may be crucial for designing interventions that will align beliefs with facts and allow the endorsement of a shared reality for everyone across the political spectrum.

Researchers have proposed two main perspectives to explain the effect of party affiliation on political reasoning [45, 49]. According to one perspective, parties act as heuristics: people use information about party endorsement of particular attitudes, beliefs, or policies as cues that guide their own position either directly through low-effort strategies ('if my party holds this position then it must be the right one'), or through deductions about the content of the policies with higher-effort strategies ('if my party holds this position, then it must support this core value



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Figure 2. The Value of Beliefs Shapes Different Cognitive Processes. The identity-based model of belief assumes that partisan identities determine the value of different beliefs and can therefore distort belief at different states of cognitive processing, including **executive function**, attention control, memory, implicit evaluation (corresponding to the amygdala/hippocampus, not visible from this perspective), and visual perception. This cartoon roughly illustrates that these cognitive processes have dissociable neural substrates and can be treated as being functionally distinct. In practice, the functional relationships between different cognitive processes are often bidirectional.

that I care about'). According to the alternative perspective, partisans engage in identity-protective reasoning (e.g., endorsing the party position [57]). This perspective argues that people often care little about the specific policies under evaluation because these rarely have important implications for their concrete daily lives. However, their personal positions on these policies or issues have strong consequences for their social identity. Maintaining beliefs and judgments that are aligned with one's political identity therefore is a higher priority than achieving accuracy, and people with the highest reasoning abilities are better able to use efficient strategies to do that, as compared to people with lowest reasoning abilities.

In this vein, one study examined the relationship between math skills and political problem-solving [58]. In the control condition, people who were strong at math were able to effectively solve an analytical problem. However, when political content was added to the same analytical problem – comparing crime data in cities that banned handguns against cities that did not – math skills no longer predicted how well people solved the problem. Instead, liberals were good at solving the problem when it proved that gun control reduced crime, and conservatives were good at solving the problem when it proved the opposite. In short, people with high numeracy skills were unable to reason analytically when the correct answer collided with their political beliefs. This is consistent with research showing that people who score high on various indicators of information processing, such as political sophistication ([59]; although see [48]), science literacy [60], numeracy abilities [58], and cognitive reflection [61], are the most likely to express beliefs congruent with those of their party.

Partisan identity has been shown to affect memory. People are more likely to incorrectly remember falsehoods that support their partisan identity: Democrats were more likely than Republicans to incorrectly remember G.W. Bush on vacation during the Katrina hurricane, and Republicans were more likely than Democrats to falsely remember seeing Barack Obama shaking hands with the President of Iran [62]. Other studies have found that conservatives are more likely to remember negative information about minority groups [63]. It is not yet clear, however, if these partisan biases are occurring at encoding, retrieval, or merely at expression.

In recent years, psychologists have observed that people may hold partisan biases outside of their conscious awareness. One paper examined the preference for political policies expressed by political in-group and out-group members using implicit attitude measures [64]. Consistent with previous work [5], people have an implicit preference for the policies proposed by their political in-group member (Democrat or Republican)—regardless of whether the policy content is in line with their ideology. Moreover, these implicit partisan preferences mediated the effect of political affiliation on explicit measures of policy preferences. It seems then that partisan identities go well beyond conscious and explicit judgments, and influence our implicit evaluations as well, suggesting that interventions targeting conscious or explicit reasoning may not fully address partisan bias.

Going one step further, there is evidence that political affiliations may even shape the way we see the world. In line with work demonstrating that social identities alter visual processing [65], a study showed that party affiliation shaped people's perceptions after watching the video of a political protest, in other words an identity-relevant event [66]. When participants thought that the video depicted liberally minded protesters (i.e., opposing military recruitment on campus), Republicans were more in favor of police intervention than Democrats, whereas the opposite emerged when participants thought the video showed a conservative protest (i.e., opposing an abortion clinic). Faced with the same visual information, people seem to have seen different things and drawn different conclusions depending on their political affiliations. Other work has found that Republicans judge the skin tone of political leaders – such as Barack Obama – as being darker than Democrats consider it to be, and these perceptions are associated with voting behavior [67]. Similarly, identification with the police seems to direct visual **attention** towards information that will support their social identity goals [68]. The effects of partisanship on perception are important, but controversial, and warrant additional research. If vision is affected by partisanship, it underlines the challenge of trying to create a shared reality across partisan divides.

How Can We Reduce Biases Related to Partisanship?

Because citizens in a democracy are expected to make informed choices [4], either by electing representatives who reflect their beliefs or by voting directly in referenda, it is important to understand how to make them more receptive to facts and less receptive to fake news. Developing a shared reality is also crucial for having fruitful policy debates. In this section we propose strategies from our framework that are likely to diminish the influence of partisanship on belief. We focus on interventions that target both the antecedents of partisanship (why) and the cognitive processes that underlie the distortion of belief (how).

As we noted above, partisan identities serve important social goals for individuals. We assume that people value groups because they fulfill one or more goals (cf Figure 1) [28]. The weight (w) they place on each goal varies (per individual and as a function of context). For example, people vary in the degree to which they value epistemic rationality, and those who are also high in analytical thinking are more likely to reject inaccurate information [69]. Accordingly, when the

weight of the accuracy goal outweighs the net weight of these other goals (Σ), people will be more likely to value (V) accurate beliefs, insofar as they have access to factual information. When the net weight of these goals outweighs the accuracy goal, people are less likely to value accurate beliefs, and instead align their beliefs of party members and party dogma. As a result, two outcomes are possible: (i) when party beliefs are factually correct, these identity goals will generate accurate beliefs. (ii) When party beliefs are incorrect, these identity goals will lead to misperceptions. As a consequence, differences in accuracy between two parties will increase the polarization of beliefs (in some cases, group identity is focused on generating accurate beliefs, making the model additive rather than subtractive; for example, the accuracy goals of scientists, investigative journalists, and jurors are often aligned with their identity goals, increasing the probability that they will generate accurate beliefs.) These computations are instantiated in the ventromedial prefrontal cortex (vmPFC), with input from other brain regions (described in the section 'How Political Identities Shape the Components of Cognition').

$$V = w1\text{Accuracy} - \Sigma(w2\text{Belonging} + w3\text{Epistemic} + w4\text{Existential} + w5\text{Status} + w6\text{System} + w7\text{Moral} \dots w_n\text{OtherGoals})$$

According to this simplified framework, interventions that either fulfill social needs through nonpartisan means or motivate people to search for the truth, thereby increasing the strength of accuracy goals, will reduce partisan bias. For instance, reducing worldview or self-esteem threats by affirming an individual can open their mind to otherwise threatening information [70,71]. To make this effective in a political context, it is necessary to determine which goals produce social value for an individual and fulfill those needs. When people are hungry for belonging, they are more likely to adopt party beliefs unless they can find alternative means to satiate that goal. As such, effective interventions should target social goals that are relevant to each individual so as to decrease identity motives. An alternative strategy is to enhance the accuracy goal by incentivizing this goal or by activating identities associated with this goal. For instance, holding people accountable [72] or paying them money for accurate responses [73] can reduce partisan bias. Likewise, priming alternative identities as scientists, jurors, or editors might heighten the accuracy goal and reduce partisan bias. The success of these interventions suggests that many reported differences in factual beliefs may stem more from motivated reasoning (or simply motivated expression) rather than from memory, perception, or some unconscious process. These possibilities should be testable at the level of behavior as well as the underlying neural systems (i.e., motivated reasoning should be measurable by activation in the dorsolateral PFC and be disrupted by factors, such as cognitive load).

Another factor to consider is the potential threat to identity if the belief is wrong. People generally find uncertainty aversive [74], and learning that you have a false belief can threaten your identity, and reveal a gap in your knowledge – which activates certainty needs. Thus, corrective information that either affirms that identity or fills in the knowledge gap may be helpful. For instance, one study looked at favorability judgments following the resignation of a politician, and found that simply denying a false accusation did not change the favorability judgments. However, denying the accusation while also providing an alternative causal explanation for the resignation did [75]. This suggests that an effective way of correcting people's beliefs about false news stories might be to enrich the corrective information so as to provide a broader account of the news.

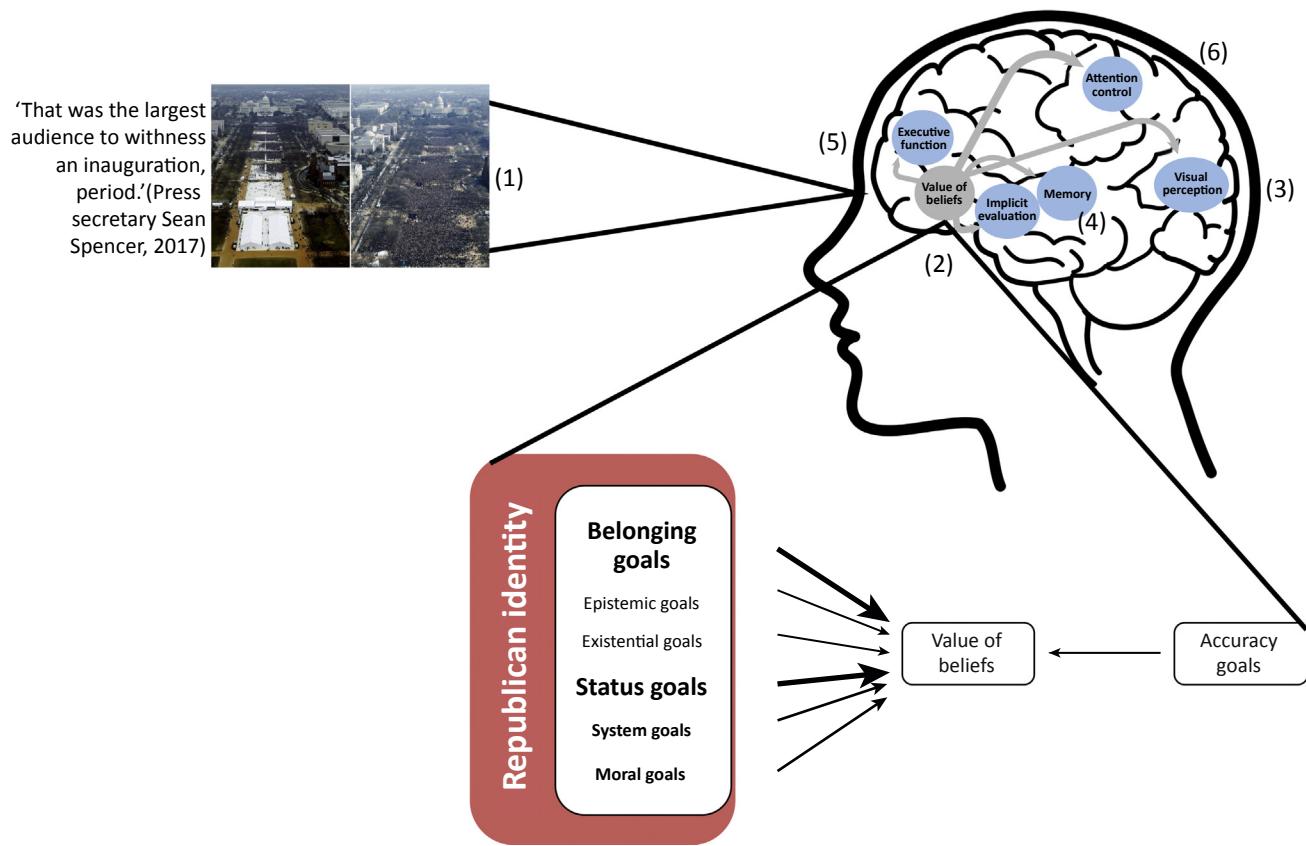
Prompting an accuracy goal to reach a correct conclusion can elicit greater cognitive effort towards that goal [59,76,77]. In fact, partisan motivated reasoning is reduced when people are asked to form accurate opinions about a policy [78]. For instance, a recent study found that curiosity towards science, namely 'a disposition to seek out and consume science information

in order to experience the intrinsic pleasure of awe and surprise' [57], reduces partisan polarization. People with high levels of science curiosity seem to be more willing to consume news that is not in line with their political identity (e.g., Democrats with greater curiosity selected more skeptical climate-change stories, and Republicans with greater curiosity selected less skeptical climate-change stories). Interacting with these counter-partisan sources reduces partisan beliefs. Similarly, helping people to realize their own ignorance about policy details – known as the explanatory depth illusion – can reduce political polarization [79] (by contrast, derogating your political opponents tends to increase polarization [80], possibly because it activates countervailing status and autonomy needs). Future research should aim to measure the dynamic interaction of these social motives, visual attention, and neural activation as partisans explore news sources.

Likewise, professional training and guidelines for evaluating evidence fairly can reduce the effect of personal values. For instance, judges receive training to make legal determinations that are unrelated to their political values, unlike members of the general public [50]. We assume that the efficacy of these roles depends on the extent to which people identify with these groups and how they perceive the norms within this group (there is little doubt that judges can be politically biased, but the group as a whole is often motivated to follow legal guidelines that increase impartiality). Altogether, the evidence suggests that politically motivated cognition is indeed malleable and can be reduced with incentives and by education that fosters curiosity, accuracy, and accountability.

Another factor to keep in mind while building interventions is the importance of the source of the message (an example is given in [Figure 3](#)). The social influence literature has found that people resist influence from out-groups to protect their in-group identity [81,82], and they are less likely to trust political out-group members and are more likely to detect dodging from an out-group politician than from an in-group politician [83]. There is evidence that creating a superordinate identity can reduce group bias in implicit evaluations [84,85] and person perception [86,87]. Therefore, interventions should aim at appealing to a superordinate identity that includes all targets of the message – such as Americans or human beings – or find a trusted source within the political party of the target to deliver the message [88,89]. Indeed, group criticism is received less defensively when it is made by an in-group member than when made by an outsider because the intentions of the critic are perceived as constructive [90].

A distinguishing feature of our model of the partisan brain is that interventions should target the relevant cognitive process where the partisan bias is entering (this stems from the assumption that these processes are functionally dissociable in the human brain [55]). For instance, if an individual is engaged in motivated reasoning, then presenting them with additional factual information is unlikely to be of much value – they will either find a way to dismiss the source or counter-argue against the evidence. In this case, one may need to affirm their identity motives or disrupt their capacity to reason. This same strategy is unlikely to be effective if the source of the bias is unconscious because these processes unfold automatically, without motivation or cognitive capacity [91]. To change implicit partisan evaluations, an intervention should aim to change the underlying associations [92] or activate an alternative, or superordinate, social identity [93]. Likewise, correcting distortions in memory will require deep and repeated engagement with the political content or effective cues for retrieval [94]. In theory, these interventions could also involve selective stimulation or impairment of brain regions (e.g., using transcranial magnetic stimulation and lesion patients). We argue that designing targeted process-based intervention will increase the impact of factual information on highly identified partisans.



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Figure 3. A Case Where Partisan Identity Altered Reported Belief in Crowd Size. (1) A Republican party member sees pictures of the crowds at the Presidential inaugurations of Barack Obama (2009, right picture) and Donald Trump (2017, left picture). (2) The value of beliefs is computed in the ventromedial prefrontal cortex (vmPFC) as a function of the identity goals that are active for that person. The statement by the Press Secretary – an elite member of their party – fulfills multiple goals (the width of the arrows represents the strength of the goals), including: (i) belonging goals, because they are an in-group member; (ii) status goals, because he said the inauguration audience was larger than those of Presidents from the out-group; (iii) system goals, because the inauguration is an important American political tradition; (iv) moral goals, because loyalty is expected to the President. Other goals are less relevant. (3) The visual information is guided by attentional control in the parietal lobe and is processed in the occipital lobe with guidance from the value of beliefs computed in the vmPFC. (4) If prompted to recall that information, episodic memory of the crowds is constructed via the hippocampus, with guidance from the values of beliefs computed in the vmPFC. (5) Partisans can use the lateral PFC to engage in motivated reasoning to justify the size of the crowds or discredit the relevance of the photographic evidence. (6) Partisans might also report an inaccurate answer, despite accurate beliefs, to avoid conceding evidence that violates their identity goals.

Our model helps to explain why correcting misinformation is often ineffective. For instance, corrective information is frequently unable to change political misperceptions or false facts ([95]; see also [96–99]). Another implication of our model is that changing false beliefs about a political candidate may not change evaluations because these are subserved by different cognitive processes. For instance, correcting erroneous positive beliefs about Donald Trump was sufficient to shatter those beliefs. However, it did not change support for Donald Trump among his supporters. This underscores that the distortion of beliefs is only one element of political preference.

Concluding Remarks

It is urgent to understand and address how partisanship shapes belief. Political polarization has increased dramatically in the USA^v over the past few decades and is likely to continue to increase as people tune out ideologically-incongruent news^{vi}, curate echo chambers on their

social media accounts^{vii}, and move to ideologically like-minded parts of the world [100]. It is thus a modern paradox how our increased access to information has isolated us in ideological bubbles and occluded us from facts. As comedian Stephen Colbert has noted: 'It used to be, everyone was entitled to their own opinion, but not their own facts. But that's not the case anymore. Facts matter not at all. Perception is everything.' Although cognitive scientists still have a long way to go before we solve this problem (see Outstanding Questions), the current article provides a model for understanding why partisan identities often distort perceptions and beliefs, and offers some plausible solutions for opening our minds to a shared reality.

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Resources

- ⁱ <http://www.pewinternet.org/2016/10/04/the-politics-of-climate/>
- ⁱⁱ <https://qz.com/823183/republicans-and-democrats-cant-agree-on-the-facts/>
- ⁱⁱⁱ https://www.washingtonpost.com/news/monkey-cage/wp/2017/01/25/we-asked-people-which-inauguration-crowd-was-bigger-heres-what-they-said/?utm_term=.d7a50e4b6466
- ^{iv} <http://www.electionstudies.org/>
- ^v <http://www.people-press.org/2014/06/12/political-polarization-in-the-american-public/>
- ^{vi} <http://www.pewinternet.org/2016/10/25/political-content-on-social-media/>
- ^{vii} <http://graphics.wsj.com/blue-feed-red-feed/>

References

1. Rutjens, B.T. *et al.* (2017) Not all skepticism is equal: exploring the ideological antecedents of science acceptance and rejection. *Pers. Soc. Psychol. Bull.* Published online December 1, 2017. <http://dx.doi.org/10.1177/0146167217741314>
2. Akerlof, G.A. and Kranton, R.E. (2000) Economics and identity. *Q. J. Econ.* 115, 715–753
3. Petts, J. and Brooks, C. (2006) Expert conceptualisations of the role of lay knowledge in environmental decision making: challenges for deliberative democracy. *Environ. Plann. A* 38, 1045–1059
4. Webster, F. (1999) Knowledgeability and democracy in an information age. *Libr. Rev.* 48, 373–383
5. Cohen, G.L. (2003) Party over policy: the dominating impact of group influence on political beliefs. *J. Pers. Soc. Psychol.* 85, 808–822
6. Alford, J.R. *et al.* (2005) Are political orientations genetically transmitted? *Am. Polit. Sci. Rev.* 99, 153–167
7. Jost, J.T. *et al.* (2014) Political neuroscience: the beginning of a beautiful friendship. *Polit. Psychol.* 35, 3–42
8. Alford, J.R. and Hibbing, J.R. (2004) The origin of politics: an evolutionary theory of political behavior. *Perspect. Polit.* 2, 707–723
9. Fraley, R.C. *et al.* (2012) Developmental antecedents of political ideology: a longitudinal investigation from birth to age 18 years. *Psychol. Sci.* 23, 1425–1431
10. Block, J. and Block, J.H. (2006) Nursery school personality and political orientation two decades later. *J. Res. Pers.* 40, 734–749
11. Nam, H.H. *et al.* (2017) Amygdala structure and the tendency to regard the social system as legitimate and desirable. *Nat. Hum. Behav.* Published online December 4, 2017. <http://dx.doi.org/10.1038/s41562-017-0248-5>
12. Kanai, R. *et al.* (2011) Political orientations are correlated with brain structure in young adults. *Curr. Biol.* 21, 677–680
13. Hartstone, M. and Augoustinos, M. (1995) The minimal group paradigm: categorization into two versus three groups. *Eur. J. Soc. Psychol.* 25, 179–193
14. Bartels, L.M. (2000) Partisanship and voting behavior, 1952–1996. *Am. J. Polit. Sci.* 44, 35–50
15. Fiorina, M.P. (2002) Parties and partisanship: a 40-year retrospective. *Polit. Behav.* 24, 93–115
16. Tajfel, H. and Turner, J.C. (1986) The social identity theory of intergroup behavior. In *Key Readings in Social Psychology. Political Psychology* (Jost, J.T. and Sidanius, J., eds), pp. 276–293. Psychology Press
17. Cosmides, L. *et al.* (2003) Perceptions of race. *Trends Cogn. Sci.* 7, 173–179
18. Cikara, M. *et al.* (2017) Decoding 'us' and 'them': neural representations of generalized group concepts. *J. Exp. Psychol. Gen.* 146, 621–631
19. Cikara, M. and Van Bavel, J.J. (2014) The neuroscience of intergroup relations: an integrative review. *Perspect. Psychol. Sci.* 9, 245–274
20. Grace, D.M. *et al.* (2008) Investigating preschoolers' categorical thinking about gender through imitation, attention, and the use of self-categories. *Child Dev.* 79, 1928–1941
21. Steele, C.M. and Aronson, J. (1995) Stereotype threat and the intellectual test performance of African Americans. *J. Pers. Soc. Psychol.* 69, 797–811
22. Smith, E.R. *et al.* (2007) Can emotions be truly group level? Evidence regarding four conceptual criteria. *J. Pers. Soc. Psychol.* 93, 431–446
23. Turner, J.C. *et al.* (1994) Self and collective: cognition and social context. *Pers. Soc. Psychol. Bull.* 20, 454–463
24. Xiao, Y.J. *et al.* (2016) Perceiving the world through group-colored glasses: a perceptual model of intergroup relations. *Psychol. Inq.* 27, 255–274

Outstanding Questions

How many differences in belief between partisans are merely due to motivated expressions?

How early in the information processing hierarchy do partisan affiliations exert an influence on belief? Is motivated reasoning a conscious process, as is widely understood, or does partisan identity alter unconscious judgments as well?

Do partisan motives penetrate basic perception or perceptual awareness of political content?

Can methods from cognitive neuroscience help to disambiguate motivated expression from biased reasoning, memory, or perception?

How do our tribal instincts interact with the messages from political elites to shape partisan beliefs?

What level of monetary costs are people willing to incur to maintain their partisan beliefs?

Are there ideological asymmetries between conservatives and liberals in the dissemination and belief in misinformation? Some theories argue that conservatives are more susceptible to misinformation owing to a higher need for closure and shared reality with in-group members, whereas others argue that conservatives and liberals are both equally susceptible to motivated cognition.

What role do value violations play in the belief and dissemination of misinformation? Is all misinformation created equal, or are some people more susceptible to misinformation that conforms to their personal values?

Do moral and political convictions impair persuasion? If so, what strategies are most effective for convincing partisans to believe in accurate information?

Are these the same processes that give rise to conspiracy beliefs?

How does modern technology increase the spread and belief in misinformation? Do social media increase exposure to alternative perspectives or lead people to retreat to an echo chamber of like-minded individuals?

25. Vallone, R.P. *et al.* (1985) The hostile media phenomenon: biased perception and perceptions of media bias in coverage of the Beirut massacre. *J. Pers. Soc. Psychol.* 49, 577
26. Ross, L. (1995) Reactive devaluation in negotiation and conflict resolution. In *Barriers to Conflict Resolution* (Arrow, K., ed.), pp. 27–42, Norton & Company
27. Ross, L. and Ward, A. *et al.* (1996) Naïve realism in everyday life: Implications for social conflict and misunderstanding. In *The Jean Piaget Symposium Series. Values and Knowledge* (Reed, E.S., ed.), pp. 103–135, Lawrence Erlbaum Associates
28. Simon, B. and Klandermans, P.G. (2001) Politicized collective identity: a social psychological analysis. *Am. Psychol.* 56, 319–331
29. Baumeister, R.F. and Leary, M.R. (1995) The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychol. Bull.* 117, 497
30. Brewer, M.B. (1991) The social self: on being the same and different at the same time. *Pers. Soc. Psychol. Bull.* 17, 475–482
31. Webster, D.M. and Kruglanski, A.W. (1994) Individual differences in need for cognitive closure. *J. Pers. Soc. Psychol.* 67, 1049
32. Campbell, D.T. (1965) Ethnocentric and other altruistic motives. *Nebr. Symp. Motiv.* 13, 283–311
33. Turner, J.C. (1991) *Social Influence (Mapping Social Psychology Series)*, Thomson Brooks/Cole Publishing
34. Tetlock, P.E. (2003) Thinking the unthinkable: sacred values and taboo cognitions. *Trends Cogn. Sci.* 7, 320–324
35. Caprara, G.V. *et al.* (2006) Personality and politics: values, traits, and political choice. *Polit. Psychol.* 27, 1–28
36. Correll, J. and Park, B. (2005) A model of the ingroup as a social resource. *Pers. Soc. Psychol. Rev.* 9, 341–359
37. Festinger, L. (1962) *A Theory of Cognitive Dissonance*, Stanford University Press
38. Festinger, L. *et al.* (1964) *When Prophecy Fails: A Social and Psychological Study of a Modern Group That Predicted the Destruction of the World*, Harper Torchbooks
39. Stalder, D.R. (2010) Competing roles for the subfactors of need for closure in moderating dissonance-produced attitude change. *Pers. Individ. Differ.* 48, 775–778
40. Graham, J. *et al.* (2009) Liberals and conservatives rely on different sets of moral foundations. *J. Pers. Soc. Psychol.* 96, 1029–1046
41. Haidt, J. (2012) *The Righteous Mind: Why Good People Are Divided by Politics and Religion*, Vintage
42. Sterling, J. *et al.* (2016) Are neoliberals more susceptible to bullshit? *Judgm. Decis. Mak.* 11, 352
43. Gerber, A.S. *et al.* (2010) Party affiliation, partisanship, and political beliefs: a field experiment. *Am. Polit. Sci. Rev.* 104, 720–744
44. Campbell, A. (1980) *The American Voter*, University of Chicago Press
45. Leeper, T.J. and Slothuus, R. (2014) Political parties, motivated reasoning, and public opinion formation. *Polit. Psychol.* 35, 129–156
46. Bartels, L.M. (2002) Beyond the running tally: partisan bias in political perceptions. *Polit. Behav.* 24, 117–150
47. Gaines, B.J. *et al.* (2007) Same facts, different interpretations: partisan motivation and opinion on Iraq. *J. Polit.* 69, 957–974
48. Kam, C.D. (2005) Who toes the party line? Cues, values, and individual differences. *Polit. Behav.* 27, 163–182
49. Petersen, M.B. *et al.* (2013) Motivated reasoning and political parties: evidence for increased processing in the face of party cues. *Polit. Behav.* 35, 831–854
50. Kahan, D.M. *et al.* (2011) Cultural cognition of scientific consensus. *J. Risk Res.* 14, 147–174
51. Rangel, A. *et al.* (2008) A framework for studying the neurobiology of value-based decision making. *Nat. Rev. Neurosci.* 9, 545–556
52. Berkman, E.T. *et al.* (2017) Finding the 'self' in self-regulation: the identity-value model. *Psychol. Ing.* 28, 77–98
53. Balleine, B.W. (2005) Neural bases of food-seeking: affect, arousal and reward in corticostriatolimbic circuits. *Physiol. Behav.* 86, 717–730
54. Wikenheiser, A.M. and Schoenbaum, G. (2016) Over the river, through the woods: cognitive maps in the hippocampus and orbitofrontal cortex. *Nat. Rev. Neurosci.* 17, 513–523
55. Cunningham, W.A. *et al.* (2007) The iterative reprocessing model: a multilevel framework for attitudes and evaluation. *Soc. Cogn.* 25, 736–760
56. Chaumon, M. *et al.* (2013) Visual predictions in the orbitofrontal cortex rely on associative content. *Cereb. Cortex* 24, 2899–2907
57. Kahan, D.M. (2017) The expressive rationality of inaccurate perceptions. *Behav. Brain Sci.* 40, e6
58. Kahan, D.M. (2013) Ideology, motivated reasoning, and cognitive reflection: an experimental study. *Judgm. Decis. Mak.* 8, 407–424
59. Taber, C.S. and Lodge, M. (2016) The illusion of choice in democratic politics: the unconscious impact of motivated political reasoning. *Polit. Psychol.* 37, 61–85
60. Drummond, C. and Fischhoff, B. (2017) Individuals with greater science literacy and education have more polarized beliefs on controversial science topics. *Proc. Natl. Acad. Sci.* 114, 9587–9592
61. Kahan, D.M. *et al.* (2012) The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nat. Clim. Change* 2, 732–735
62. Frenda, S.J. *et al.* (2013) False memories of fabricated political events. *J. Exp. Soc. Psychol.* 49, 280–286
63. Castelli, L. and Carraro, L. (2011) Ideology is related to basic cognitive processes involved in attitude formation. *J. Exp. Soc. Psychol.* 47, 1013–1016
64. Smith, C.T. *et al.* (2012) Rapid assimilation: automatically integrating new information with existing beliefs. *Soc. Cogn.* 30, 199–219
65. Molenberghs, P. *et al.* (2013) Seeing is believing: neural mechanisms of action – perception are biased by team membership. *Hum. Brain Mapp.* 34, 2055–2068
66. Kahan, D.M. *et al.* (2012) They saw a protest: cognitive illiberalism and the speech-conduct distinction. *Stanford Law Rev.* 64, 851
67. Caruso, E.M. *et al.* (2009) Political partisanship influences perception of biracial candidates' skin tone. *Proc. Natl. Acad. Sci.* 106, 20168–20173
68. Granot, Y. *et al.* (2014) Justice is not blind: visual attention exaggerates effects of group identification on legal punishment. *J. Exp. Psychol. Gen.* 143, 2196
69. Ståhl, T. and van Prooijen, J.-W. (2018) Epistemic rationality: skepticism toward unfounded beliefs requires sufficient cognitive ability and motivation to be rational. *Pers. Individ. Differ.* 122, 155–163
70. Steele, C.M. (1988) The psychology of self-affirmation: sustaining the integrity of the self. *Adv. Exp. Soc. Psychol.* 21, 261–302
71. Čehajić, S. *et al.* (2011) Affirmation, acknowledgment of in-group responsibility, group-based guilt, and support for reparative measures. *J. Pers. Soc. Psychol.* 101, 256–270
72. Lerner, J.S. and Tetlock, P.E. (1999) Accounting for the effects of accountability. *Psychol. Bull.* 125, 255
73. Bullock, J.G. *et al.* (2013) *Partisan Bias in Factual Beliefs about Politics*, National Bureau of Economic Research
74. Park, C.L. (2010) Making sense of the meaning literature: an integrative review of meaning making and its effects on adjustment to stressful life events. *Psychol. Bull.* 136, 257
75. Nyhan, B. and Reifler, J. (2015) Displacing misinformation about events: an experimental test of causal corrections. *J. Exp. Polit. Sci.* 2, 81–93

76. Baumeister, R.F. and Newman, L.S. (1994) Self-regulation of cognitive inference and decision processes. *Pers. Soc. Psychol. Bull.* 20, 3–19

77. Kunda, Z. (1990) The case for motivated reasoning. *Psychol. Bull.* 108, 480

78. Borsari, T. *et al.* (2014) The influence of partisan motivated reasoning on public opinion. *Polit. Behav.* 36, 235–262

79. Fernbach, P.M. *et al.* (2013) Political extremism is supported by an illusion of understanding. *Psychol. Sci.* 24, 939–946

80. Suhay, E. *et al.* (2018) The polarizing effects of online partisan criticism: evidence from two experiments. *Int. J. Press* 23, 95–115

81. Abrams, D. and Hogg, M.A. (1990) Social identification, self-categorization and social influence. *Eur. Rev. Soc. Psychol.* 1, 195–228

82. Mugny, G. *et al.* (1984) Influence minoritaire et relations entre groupes: l'importance du contenu du message et des styles de comportement. *Rev. Suisse Psychol. Pure Appl.* 43, 331–351

83. Clementson, D.E. (2017) Truth bias and partisan bias in political deception detection. *J. Lang. Soc. Psychol.* Published online November 22, 2017. <http://dx.doi.org/10.1177/0261927X17744004>

84. Scroggins, W.A. *et al.* (2016) Reducing prejudice with labels: shared group memberships attenuate implicit bias and expand implicit group boundaries. *Pers. Soc. Psychol. Bull.* 42, 219–229

85. Van Bavel, J.J. and Cunningham, W.A. (2009) Self-categorization with a novel mixed-race group moderates automatic social and racial biases. *Pers. Soc. Psychol. Bull.* 35, 321–335

86. Van Bavel, J.J. *et al.* (2008) The neural substrates of in-group bias: a functional magnetic resonance imaging investigation. *Psychol. Sci.* 19, 1131–1139

87. Van Bavel, J.J. *et al.* (2011) Modulation of the fusiform face area following minimal exposure to motivationally relevant faces: evidence of in-group enhancement (not out-group disregard). *J. Cogn. Neurosci.* 23, 3343–3354

88. Gaertner, S.L. *et al.* (1993) The common ingroup identity model: recategorization and the reduction of intergroup bias. *Eur. Rev. Soc. Psychol.* 4, 1–26

89. Wenzel, M. *et al.* (2008) Superordinate identities and intergroup conflict: the ingroup projection model. *Eur. Rev. Soc. Psychol.* 18, 331–372

90. Hornsey, M.J. and Imani, A. (2004) Criticizing groups from the inside and the outside: an identity perspective on the intergroup sensitivity effect. *Pers. Soc. Psychol. Bull.* 30, 365–383

91. Fazio, R.H. (1990) Multiple processes by which attitudes guide behavior: the MODE model as an integrative framework. *Adv. Exp. Soc. Psychol.* 23, 75–109

92. Gawronski, B. and Bodenhausen, G.V. (2011) The associative-propositional evaluation model: theory, evidence, and open questions. *Adv. Exp. Soc. Psychol.* 44, 59

93. Van Bavel, J.J. and Cunningham, W.A. (2011) A social neuroscience approach to self and social categorisation: a new look at an old issue. *Eur. Rev. Soc. Psychol.* 21, 237–284

94. Crowder, R.G. (2014) *Principles of Learning and Memory (Classic Edition)*, Psychology Press

95. Thorson, E. (2016) Belief echoes: the persistent effects of corrected misinformation. *Polit. Commun.* 33, 460–480

96. Cobb, M.D. *et al.* (2013) Beliefs don't always persevere: how political figures are punished when positive information about them is discredited. *Polit. Psychol.* 34, 307–326

97. Nyhan, B. *et al.* (2013) The hazards of correcting myths about health care reform. *Med. Care* 51, 127–132

98. Nyhan, B. and Reifler, J. (2015) Does correcting myths about the flu vaccine work? An experimental evaluation of the effects of corrective information. *Vaccine* 33, 459–464

99. Nyhan, B. (2010) Why the 'death panel' myth wouldn't die: misinformation in the health care reform debate. *Forum* 8 (1),

100. Motyl, M. *et al.* (2014) How ideological migration geographically segregates groups. *J. Exp. Soc. Psychol.* 51, 1–14